

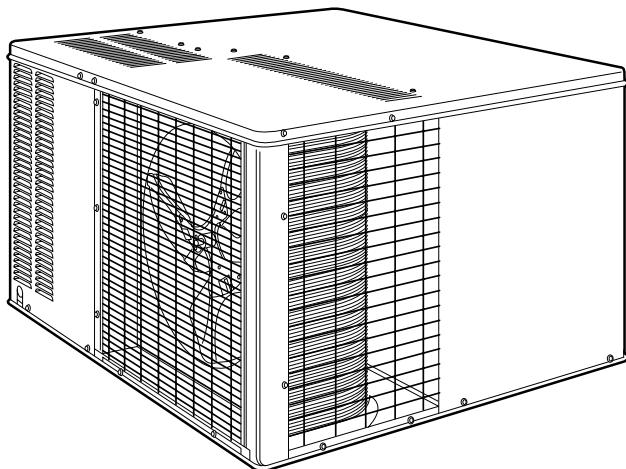


HEATING & COOLING

# Product Data

## 50SX High Efficiency Single-Packaged Cooling Units

2 to 5 Nominal Tons



UNIT 50SX

High Efficiency, Single-Packaged Cooling Unit for Manufactured Housing and Residential use.

### Features/Benefits

One-piece cooling units with accessory electric heaters; low installation costs; highly efficient, dependable performance; and easy maintenance.

#### Efficient operation

**High-efficiency design** with SEERs (Seasonal Energy Efficiency Ratios) up to 12.0.

#### Easy Installation

**Factory-assembled package** is a compact, fully self-contained, electric cooling unit that is prewired, pre-piped, and precharged for minimum installation expense.

50SX units are available in a variety of standard cooling sizes to meet residential requirements. Units install easily on a rooftop or ground-level pad. The base rail provides an elevated base.

**Convertible duct configuration** on the 50SX is designed for easy use in either downflow (vertical) or horizontal discharge applications.

#### Durable, dependable components

**Compressors** are designed for high efficiency. Each compressor is hermetically sealed against contamination to help promote longer life and dependable operation.

Vibration isolation provides quiet operation. Compressors have internal high-pressure and overcurrent protection. Scroll compressors are standard on all units.

**Direct-drive multispeed, PSC (permanent split capacitor) blower motor** is standard on all size 024-042 units.

Variable-speed ECM integrated control motors are standard on 048 and 060 units.

**Direct-drive, PSC condenser-fan motors** are designed to help reduce energy consumption and provide for cooling operation down to 40°F.

**Refrigerant system** is designed to provide dependability. Liquid refrigerant strainers are used to promote clean, unrestricted operation. Each unit leaves the factory with a full refrigerant charge. Refrigerant service connections make checking operating pressures easier.

**Evaporator and condenser coils** are computer-designed for optimum heat transfer and cooling efficiency. Condenser coil is fabricated of copper tube and aluminum fins and is located inside the unit to protect against damage and ensure long life and reliable operation. The condenser coil is protected by a rubber-coated, metal grille.

Copper fin coils or coated coils are also available by special order. These coils are recommended in applications where aluminum fins are likely to be damaged due to corrosion. They are ideal for seacoast applications.

**Weatherized cabinets** are constructed of heavy-duty, phosphated, zinc-coated prepainted steel capable of withstanding 500 hours of salt spray. Interior surfaces of the evaporator compartment are insulated with foil-faced fiberglass to help keep the conditioned air from being affected by the outdoor ambient temperature and to provide improved air quality. Unit insulation conforms to American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) No. 62P. A sloped condensate pan permits an external drain.

**Low sound ratings** ensure a quiet indoor and outdoor environment with

sound ratings as low as 80 dB.

**Easy to service cabinets** provide easy accessibility to serviceable components during installation and maintenance. Rounded corners are an important safety feature. A high-quality finish ensures an attractive appearance.

**Round duct connections (sizes 024-042) and rectangular duct connections (sizes 048, 060)** provide easy installation for manufactured housing.

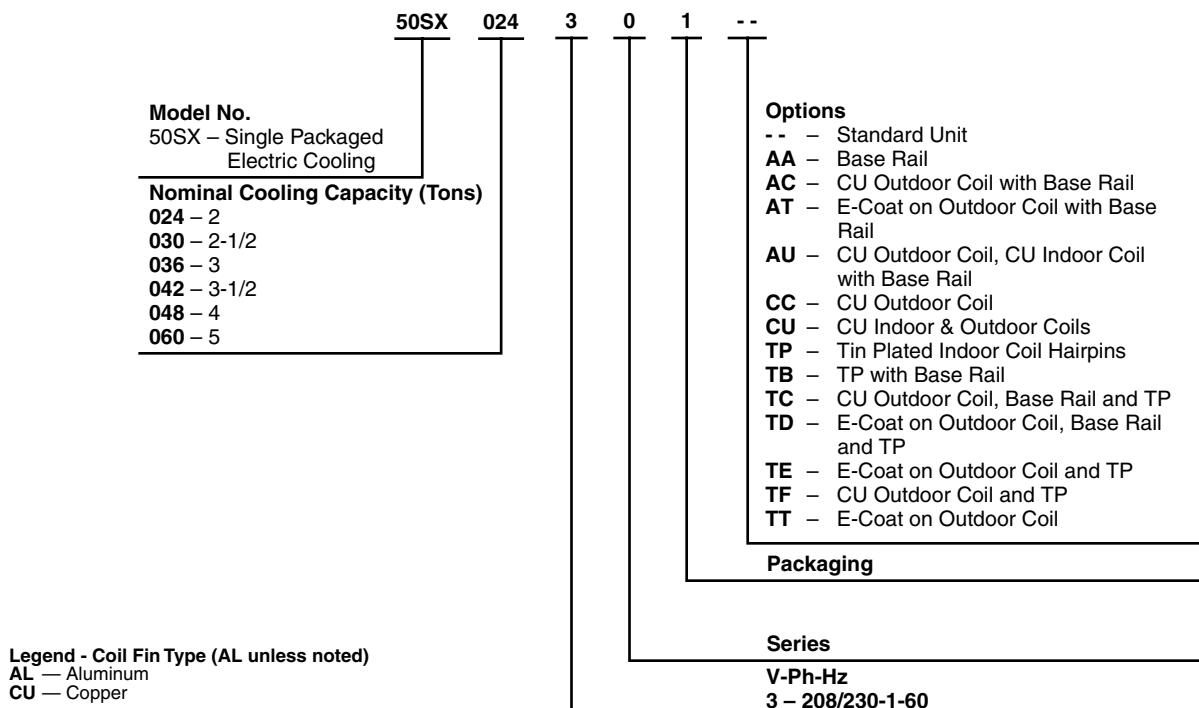
**Compact size** enables the unit to be located where space is limited.

**Optional base rails** provide holes for rigging and handling, as well as an elevated mounting frame that gives all single-phase units additional structural support to horizontal installations.

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# Model number nomenclature



## ARI\* capacities

### COOLING CAPACITIES AND EFFICIENCIES

UNIT 50SX	NOMINAL TONS	STANDARD CFM	NET COOLING† CAPACITIES (Btuh)	SEER†**	SOUND RATINGS†† (dB)
024-311	2	785	23,400	12.0	80
024-321	2	750	23,400	12.0	80
030	2-1/2	990	29,800	12.0	80
036	3	1225	36,800	12.0	80
042	3-1/2	1400	41,500	12.0	80
048-311	4	1585	47,500	12.0	82
048-321	4	1550	45,500	12.0	82
060	5	1995	60,000	11.0	82

#### LEGEND

- dB** — Sound Levels (1 Bel = 10 Decibels)
- db** — Dry Bulb
- DOE** — Department of Energy
- SEER** — Seasonal Energy Efficiency Ratio
- wb** — Wet Bulb

\* Air Conditioning & Refrigeration Institute.

† Rated in accordance with U.S. Government DOE test procedures and/or ARI Standard 210/240-89.

\*\* All units have factory-installed time-delay relay.

†† Rated in accordance with ARI Standard 270-95 (not listed in ARI).

NOTES: Ratings are net values, reflecting the effects of circulating fan heat. Ratings are based on: 80°F db, 67°F wb indoor entering-air temperature and 95°F db condenser entering-air temperature.



## OUTDOOR SOUND: OCTAVE BAND DATA — DECIBELS

FREQUENCY (Hz)	SOUND POWER LEVEL FOR 50SX UNIT					
	024	030	036	042	048	060
63	45.7	48.7	49.1	48.4	56.0	54.3
125	60.7	61.9	65.5	61.9	65.6	65.1
250	74.8	76.5	71.6	71.3	71.5	71.5
500	73.4	69.7	71.6	71.3	71.4	72.7
1000	74.0	72.1	71.7	72.7	74.2	73.9
2000	71.8	69.2	70.0	70.3	73.3	73.4
4000	69.2	64.3	68.7	66.6	69.6	71.7
8000	60.8	57.2	63.7	59.2	67.1	66.3

## Physical data

UNIT SIZE 50SX	024	030	036	042	048	060
REFRIGERANT Metering Device Charge (lb)			R-22 Acutrol™ System			
OPERATING WEIGHT (lb) Without Base Rails With Optional Base Rails	3.9	4.5	5.4	5.7	5.8	6.5
COMPRESSOR TYPE	Scroll					
EVAPORATOR FAN Motor Type Speeds Nominal Rpm Diameter (in.) Width (in.) Nominal Airflow (Cfm) Motor Hp			Centrifugal — Direct Drive			
Cfm Nominal Rpm Diameter (in.) Motor Hp	Std 3 1075 10 9 800 1/4	Std 3 1075 10 9 1000 1/4	Std 3 1100 10 9 1200 1/2	Std 3 1100 10 9 1400 1/2	ECM Variable — 10 9 1600 1	ECM Variable — 10 9 1995 1
EVAPORATOR COIL Rows—Fins/in. Face Area (sq ft)	2—15 3.60	3—15 2.70	4—15 3.60	3—15 4.44	4—15 4.44	4—15 4.44
CONDENSER FAN Cfm Nominal Rpm Diameter (in.) Motor Hp			Propeller—Direct Drive			
Cfm Nominal Rpm Diameter (in.) Motor Hp	2200 1100 20 1/4	2200 1100 20 1/4	2200 1100 20 1/4	2400 1100 20 1/4	2400 1100 20 1/4	2400 1050 20 1/3
CONDENSER COIL Rows—Fins/in. Face Area (sq ft)	2—17 7.00	2—17 7.00	2—17 7.00	2—17 8.66	2—17 8.66	2—17 8.66
FILTER SIZE (in.)† Throwaway	24 x 24	24 x 24	24 x 24	24 x 30	24 x 30	24 x 30

### LEGEND

ECM — Electronic Integrated Control Motor

† Recommended field-supplied filters are 1 in. thick.

NOTE: Standard motors are PSC Type.

# Options and accessories

## Options

**Unit with base rail** provides holes for rigging and handling unit; frame provides elevation and support for horizontal applications.

**Coil options** include Tin-Plated\* indoor hairpins, copper/copper and vinyl-coated construction for refrigerant coils. Units are shipped standard with copper tube/aluminum fin construction. See model number nomenclature for coil options.

\*Tin-Plated indoor coils are built with special hairpins that are designed to resist both general pitting corrosion and excessive indoor corrosion (Formicary Corrosion).

## Accessories

ACCESSORY	
Flat Roof Curb	8 in. 11 in. 14 in.
Manual Outdoor-Air Damper	
Filter Rack	
Duct Cover Kit	
Lifting Bracket Kit	
Rectangular Duct Connection Kit	
Thermostat and Subbase	
Electronic Programmable Thermostat	
Low-Pressure Switch Kit	
High-Pressure Switch Kit	
Low-Ambient Kit	
Electric Heaters with Single-Point Kit (5.0 to 20.0 kW)	

**Factory-assembled roof curbs** are designed for use on downflow discharge applications. Heavy gage, galvanized steel construction provides one-piece

support. The curb complies with the standards of the NRCA (National Roofing Contractors Association). A wood nailing strip is provided for attaching the roofing to the curb.

**Manual outdoor air damper** provides for minimum outdoor air and is manually adjustable. The device closes automatically whenever the evaporate fan is not operating.

**Thermostat** provides heating and cooling unit control.

**Low-ambient kit (Motormaster® II device)** allows the use of mechanical cooling down to outdoor ambient temperatures as low as 0°F.

**Electric heaters** provide heat in the unit when required. Each package has a heater module that slides into keyed mounting slots in the fan inlet. Heater sizes range from 5.0 to 20.0 kW. The electric heater design allows the use of a single-point power supply for the entire unit, resulting in lower installed costs.

**High- and low-pressure switches** provide additional safety features and protect the unit from running at unsuitable pressures.

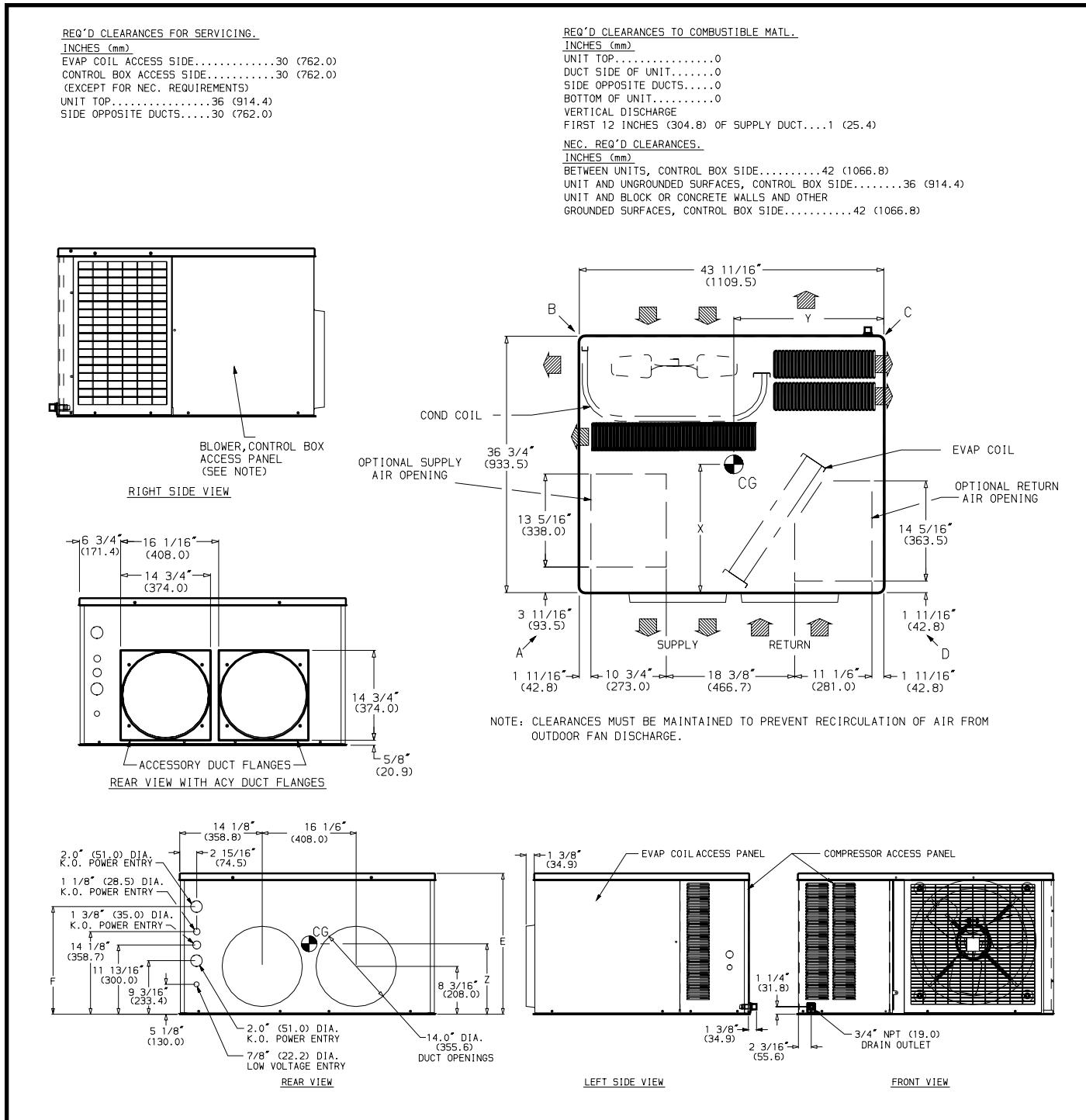
**Filter rack** features easy installation, serviceability, and high filtering performance in downflow and horizontal applications.

**Duct cover kit** covers horizontal ducts after unit has been converted to downflow discharge.

**Lifting bracket kit** provides attachment points for rigging straps. The kit is not required when the unit is equipped with an optional base rail.

**Rectangular duct connection kit** allows easy conversion from round to rectangular ducts.

# Base unit dimensions

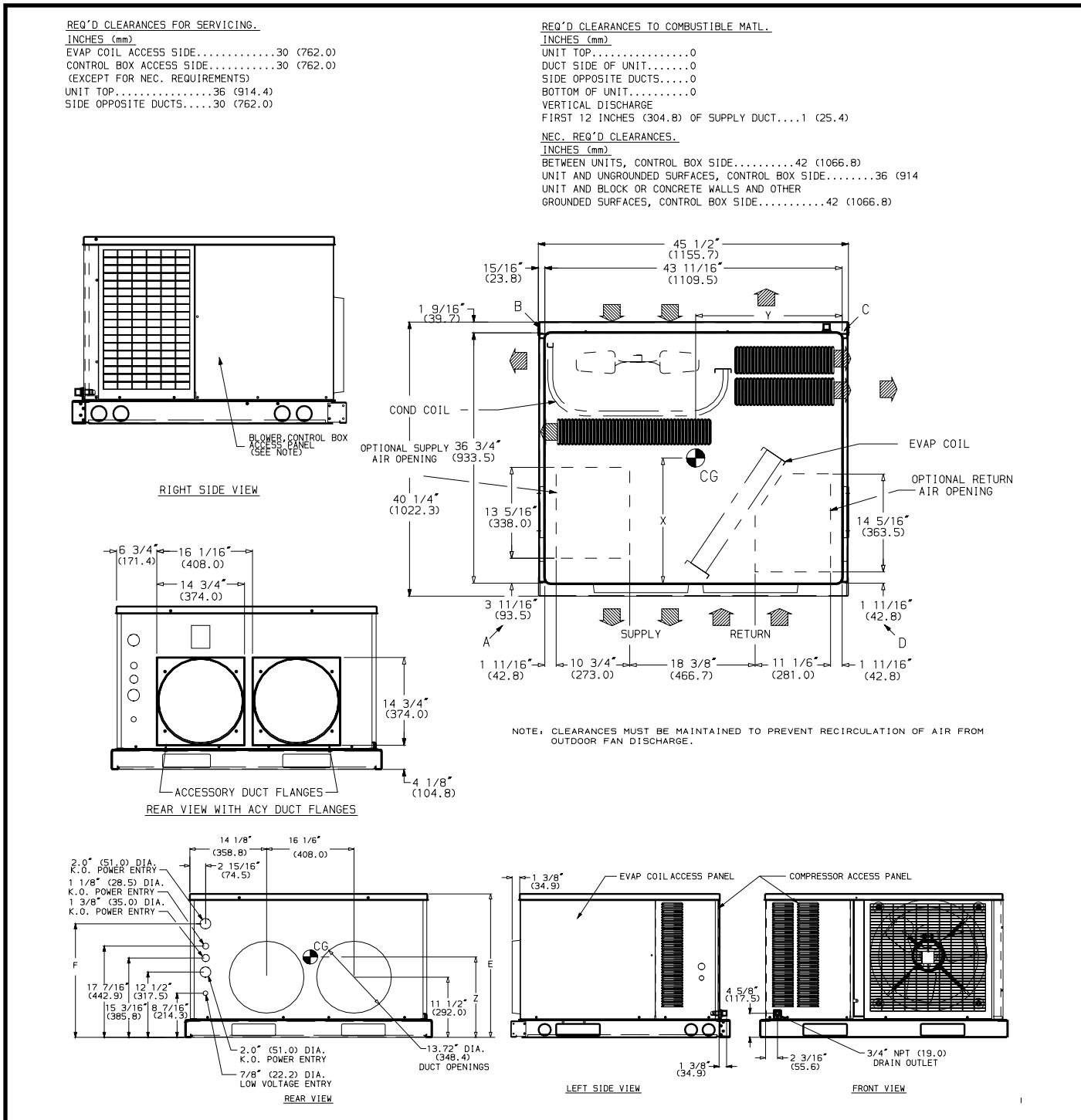


50SX024-036 WITHOUT BASE RAIL

UNIT 50SX	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (Lb/Kg)				UNIT HEIGHT (in.)
		Lb	Kg	A	B	C	D	
024	208/230-1-60	270	123	67/30	62/28	99/45	42/19	28-1/8
030	208/230-1-60	273	124	66/30	64/29	100/45	43/20	28-1/8
036	208/230-1-60	291	132	80/36	54/25	112/51	45/20	28-1/8

UNIT 50SX	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
024	21.7/552	20.7/527	12.7/321
030	21.9/556	20.7/525	12.7/321
036	20.8/528	20.0/507	12.7/321

# Base unit dimensions

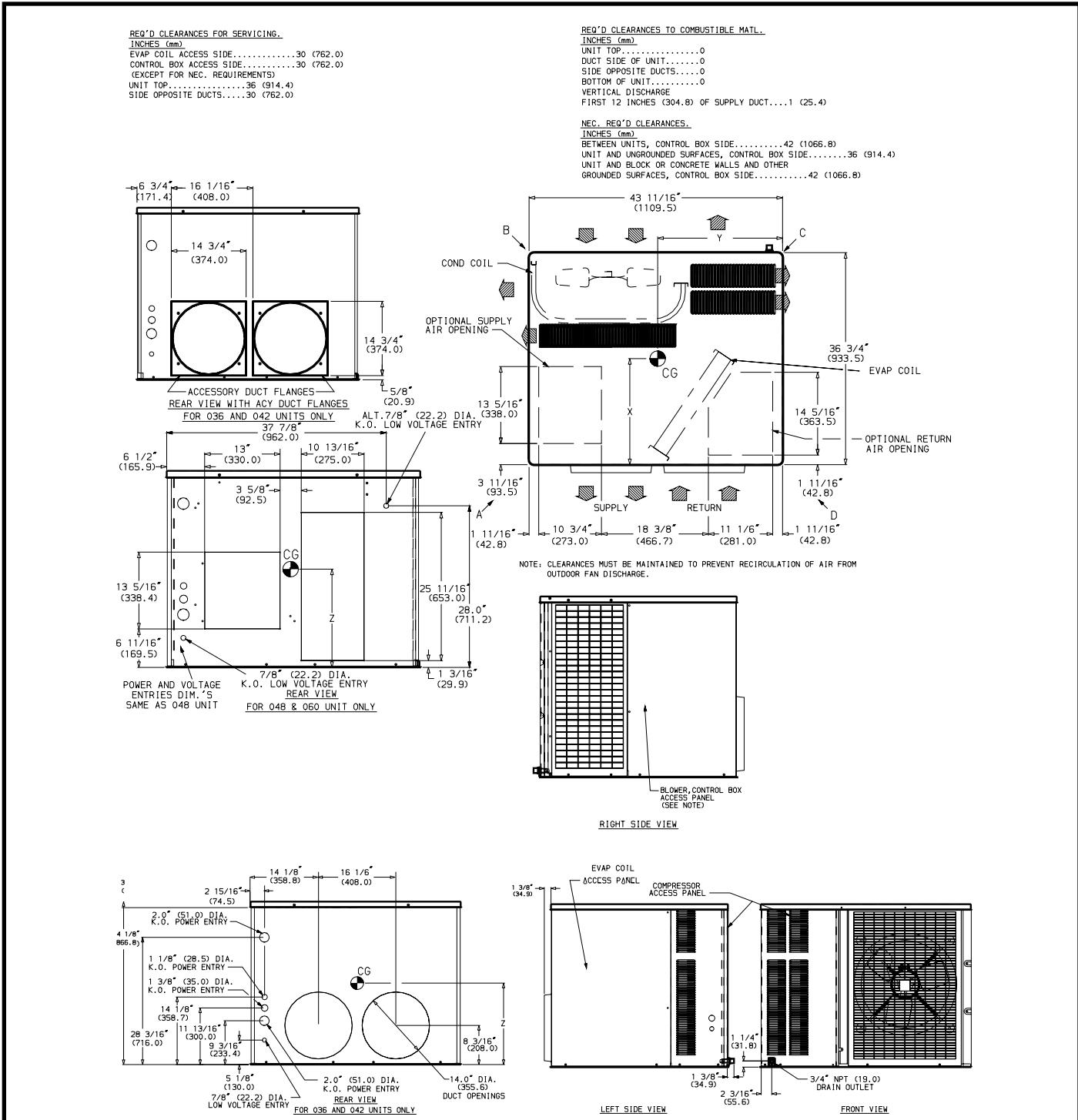


50SX024-036 WITH BASE RAIL

UNIT 50SX	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (Lb/Kg)				UNIT HEIGHT (in.)
		Lb	Kg	A	B	C	D	
024	208/230-1-60	270	123	67/30	62/28	99/45	42/19	31-3/8
030	208/230-1-60	273	124	66/30	64/29	100/45	43/20	31-3/8
036	208/230-1-60	291	132	80/36	54/25	112/51	45/20	31-3/8

UNIT 50SX	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
024	21.5/546	20.8/528	15.0/380
030	21.7/550	20.7/527	15.0/380
036	20.6/524	20.1/510	15.0/380

# Base unit dimensions

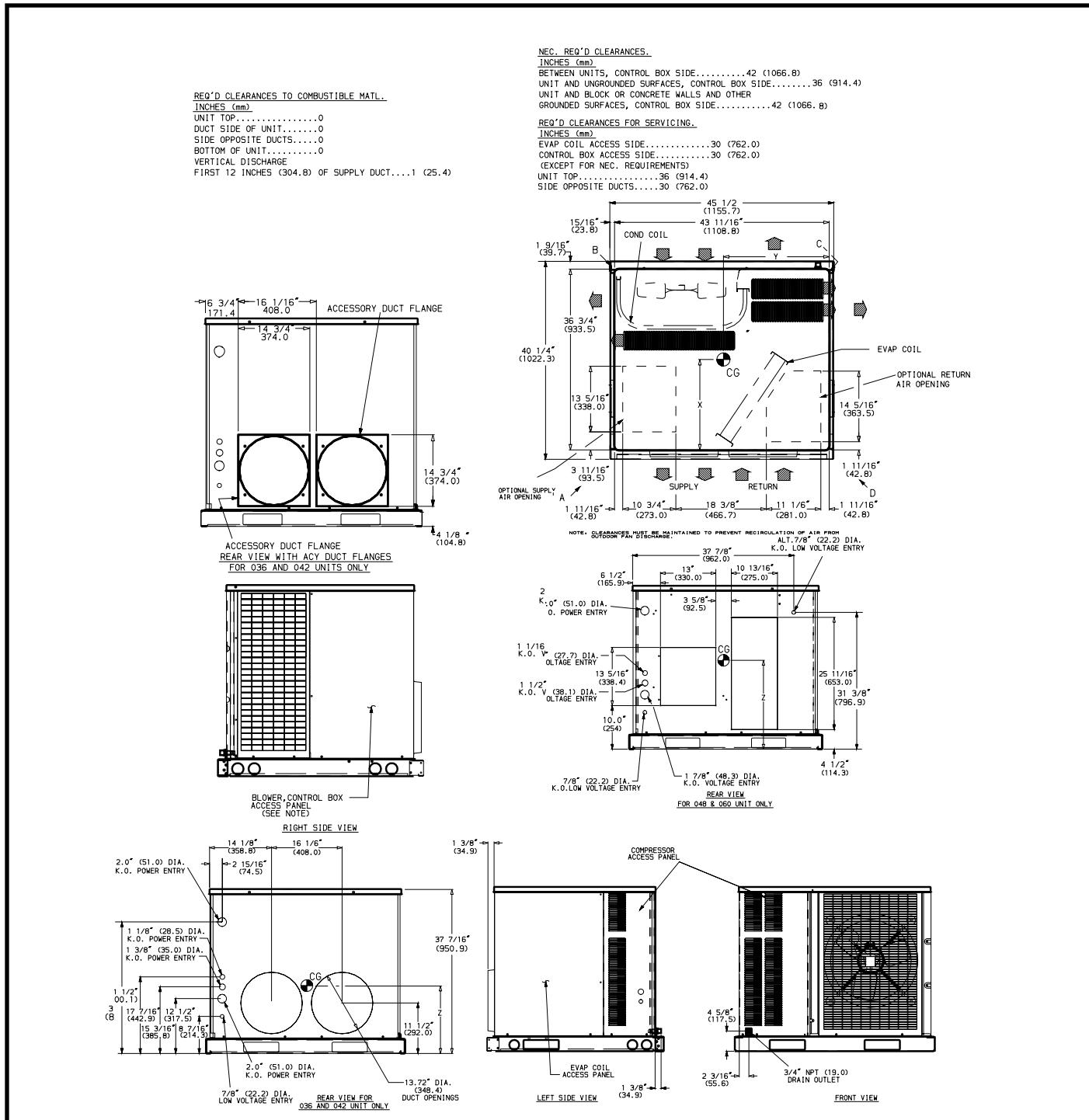


50SX042-060 WITHOUT BASE RAIL

UNIT 50SX	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (Lb/Kg)				UNIT HEIGHT (in.)
		Lb	Kg	A	B	C	D	
042	208/230-1-60	309	140	84/38	59/27	119/54	47/21	34-1/8
048	208/230-1-60	340	155	84/38	70/32	133/60	53/24	34-1/8
060	208/230-1-60	359	163	65/30	99/45	120/55	75/34	34-1/8

UNIT 50SX	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
042	21.0/533	20.1/510	15.4/390
048	21.8/553	19.7/499	15.4/390
060	22.2/565	19.8/503	13.4/340

# Base unit dimensions



50SX042-060 WITH BASE RAIL

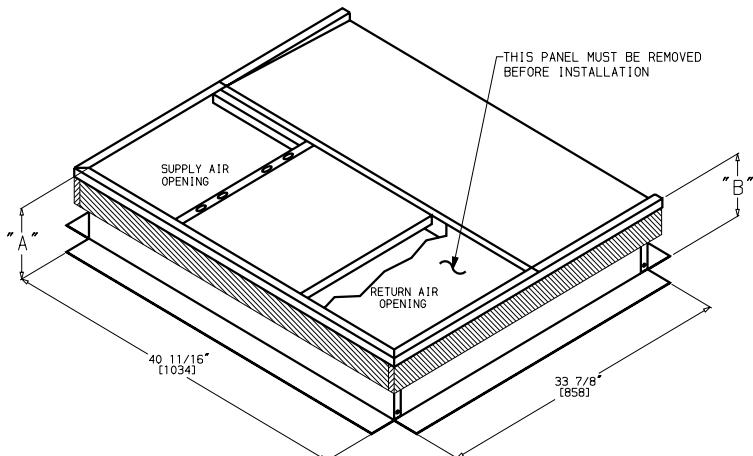
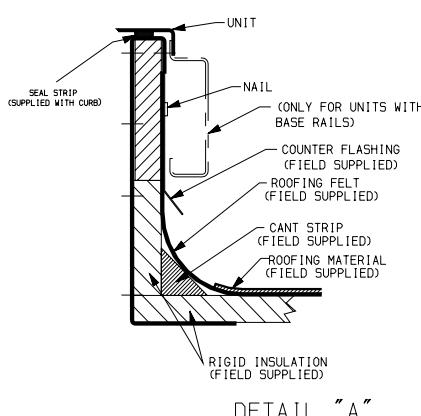
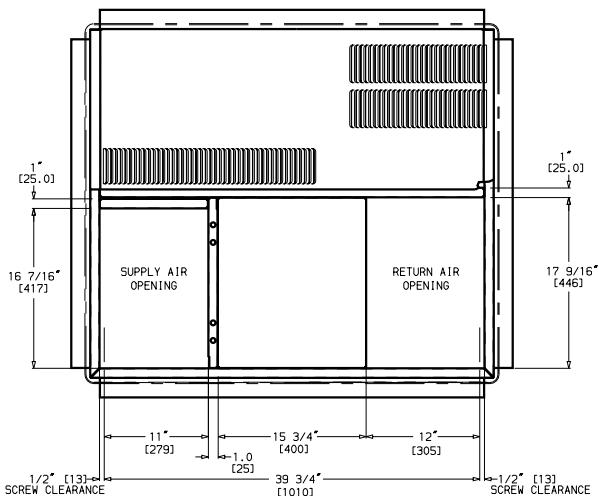
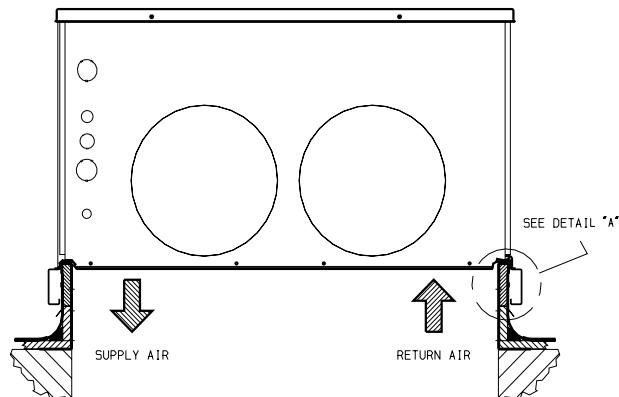
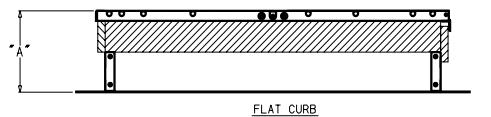
UNIT 50SX	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		CORNER WEIGHT (Lb/Kg)				UNIT HEIGHT (in.)
		Lb	Kg	A	B	C	D	
042	208/230-1-60	329	150	89/40	64/29	124/56	52/24	37-7/16
048	208/230-1-60	360	164	89/40	75/34	138/63	58/26	37-7/16
060	208/230-1-60	379	172	70/32	104/47	125/57	80/36	37-7/16

UNIT 50SX	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
042	20.8/529	20.2/512	17.3/440
048	21.6/548	19.8/502	17.3/440
060	22.0/560	19.9/506	15.7/399

# Accessory dimensions

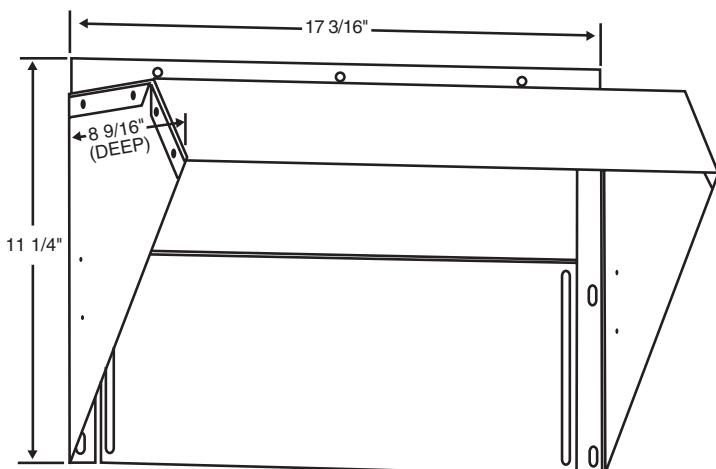
	PART NO.	"A"
FLAT CURB	CPRFCURB001A00	8" [203]
	CPRFCURB002A00	11" [279]
	CPRFCURB003A00	14" [356]

1. ROOFCURB MUST BE SET UP FOR UNIT BEING INSTALLED.
2. SEAL STRIP MUST BE APPLIED AS REQUIRED FOR UNIT BEING INSTALLED.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB IS MADE OF 16 GAUGE STEEL.
5. ATTACH DUCTWORK TO CURB (FLANGES OF DUCT REST ON CURB).
6. SERVICE CLEARANCE 4 FEET ON EACH SIDE.
7. ~~DIR~~ DIRECTION OF AIR FLOW.
8. INSULATED PANELS: 1" THK. FIBERGLASS 1# DENSITY.

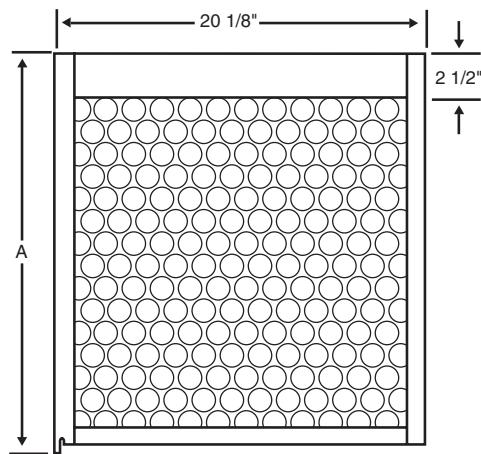


# Accessory dimensions continued

**MANUAL OUTDOOR-AIR DAMPER**



**FILTER RACKS AND FILTERS**



ACCESSORY	PART NUMBER	HEIGHT
MANUAL OUTDOOR AIR DAMPER	CPMOAPAC001A00	24-in
	CPMOAPAC002A00	28-in
	CPMOAPAC003A00	34-in

ACCESSORY	PART NUMBER	"A"
FILTER RACK	CPFILTRK003A00	31 <sup>11</sup> / <sub>16</sub> -in

# Selection procedure

## I Determine cooling and heating requirements at design conditions:

Given:

Required Cooling Capacity (TC).....	36,000 Btuh
Sensible Heat Capacity (SHC).....	26,000 Btuh
Required Heating Capacity .....	15,000 Btuh
Condenser Entering-Air Temperature .....	95°F
Evaporator Entering-Air Temperature .....	80°F edb, 67°F ewb
Evaporator-Air Quantity .....	1225 cfm
External Static Pressure .....	0.26 in. wg
Filter Pressure Drop.....	0.09 in. wg
Electrical Characteristics (V-Ph-Hz) .....	230-1-60

## II Select unit based on required cooling capacity.

Enter Cooling Capacities table at condenser entering temperature of 95°F, evaporator-air entering at 1225 cfm and 67°F ewb. The 50SX036 unit provides a total cooling capacity of 36,800 Btuh and a sensible heat capacity of 27,700 Btuh.

For evaporator-air temperature other than 80°F edb, calculate sensible heat capacity correction, as required, using the formula foundin Note 4 following the Cooling Capacities tables.

NOTE: Unit ratings are net capacities.

## III Select electric heat.

The required heating capacity is 15,000 Btuh (given). Determine the electric heat capacity in kW.

$$\frac{15,000 \text{ Btuh}}{3414 \text{ Btuh/kW}} = 4.4 \text{ kW of heat required}$$

Enter the Electric Heater Packages table on page 16 for 208/240, single-phase, 50SX036 unit. The 5-kW heater at 240v most closely satisfies the heating required. To calculate kW at 230v, multiply the heater kW by the appropriate multiplication factor found in the Wattage Multiplication Factors table on page 20.

$$5 \text{ kW} \times 0.92 = 4.6 \text{ kW}$$

$$5 \text{ kW} \times 0.92 \times 3414 = 15,704 \text{ Btuh}$$

## IV Determine fan speed and power requirements at design conditions.

Before entering the air delivery tables, calculate the total static pressure required. From the given, the Accessory Electric Heat Pressure Drop table, and the Wet Coil Pressure Drop table, find:

External Static Pressure	0.26 in. wg
Filter Pressure Drop	0.09 in. wg
Electric Heat	0.042 in. wg
Wet Coil	0.088 in. wg
Total static pressure	0.48 in. wg

Enter the table for Dry Coil Air Delivery — Horizontal and Downflow Discharge, 230 V. At 0.5 in. wg external static pressure and medium speed, the motor delivers 1300 cfm, which satisfies the job requirements.

# Performance data

## NET COOLING CAPACITIES

50SX024-311

Temp (F) Air Ent Condenser (Edb)		Evaporator Air—Cfm/BF								
		700/0.13			785/0.14			900/0.115		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC SHC kW	26.2 12.2 2.00	24.0 15.6 1.99	21.8 18.8 1.99	26.5 12.5 2.04	24.3 16.4 2.03	22.1 19.7 2.02	26.8 12.9 2.07	24.6 17.1 2.07	22.5 20.7 2.06
95	TC SHC kW	25.5 12.0 2.18	23.1 15.4 2.17	20.6 18.3 2.17	25.8 12.4 2.22	23.4 16.1 2.21	21.2 19.5 2.21	25.8 12.5 2.25	23.7 16.9 2.25	21.5 20.5 2.24
105	TC SHC kW	24.5 11.7 2.39	22.1 15.1 2.38	19.0 17.6 2.36	24.9 12.2 2.42	22.5 16.0 2.42	19.5 18.8 2.40	25.0 12.5 2.46	22.7 16.7 2.45	20.2 19.9 2.44
115	TC SHC kW	23.3 11.4 2.61	20.8 14.6 2.60	18.1 17.1 2.58	23.6 11.9 2.65	21.1 15.5 2.64	18.0 17.9 2.62	23.8 12.2 2.68	21.4 16.4 2.68	18.6 18.5 2.67

50SX024-321

Temp (F) Air Ent Condenser (Edb)		Evaporator Air—Cfm/BF								
		700/0.13			785/0.14			900/0.15		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC SHC kW	26.2 13.1 2.0	24.2 16.5 1.9	22.2 19.6 1.9	26.3 13.4 2.0	24.4 17.3 2.0	22.5 20.8 2.0	26.5 13.8 2.1	24.5 18.0 2.1	22.9 21.9 2.0
95	TC SHC kW	25.3 12.8 2.2	23.2 16.2 2.2	21.2 19.2 2.1	25.5 13.2 2.2	23.4 16.9 2.2	21.6 20.2 2.2	25.6 13.6 2.3	23.6 17.8 2.3	22.1 21.3 2.3
105	TC SHC kW	24.4 12.5 2.4	22.2 15.7 2.4	20.2 18.8 2.4	24.5 12.9 2.5	22.3 16.5 2.4	20.6 19.8 2.4	24.6 13.4 2.5	22.4 17.5 2.5	21.4 20.0 2.5
115	TC SHC kW	23.2 12.1 2.7	20.9 15.1 2.6	19.0 18.3 2.6	23.4 12.5 2.7	21.0 16.0 2.7	19.8 18.5 2.6	23.4 13.0 2.8	21.1 17.0 2.8	20.5 18.8 2.7

50SX030

Temp (F) Air Ent Condenser (Edb)		Evaporator Air—Cfm/BF								
		875/0.10			990/0.11			1125/0.12		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC SHC kW	33.0 16.4 2.59	30.5 20.9 2.56	27.8 25.3 2.54	33.6 16.9 2.64	31.1 22.2 2.61	28.4 26.9 2.59	34.2 17.6 2.70	31.4 23.3 2.66	28.9 28.2 2.64
95	TC SHC kW	32.0 15.9 2.82	29.3 20.5 2.79	25.9 24.4 2.75	32.4 16.5 2.87	29.8 21.7 2.84	27.0 26.2 2.81	32.9 17.3 2.93	30.1 22.8 2.89	27.6 27.4 2.86
105	TC SHC kW	30.8 15.5 3.07	27.8 20.1 3.04	24.0 23.4 2.99	31.1 16.1 3.13	28.3 21.3 3.10	24.8 24.8 3.05	31.3 16.7 3.18	28.7 22.5 3.14	26.1 26.1 3.11
115	TC SHC kW	29.2 15.1 3.36	25.7 19.3 3.31	22.9 22.7 3.26	29.6 15.8 3.41	25.9 20.5 3.37	23.1 23.1 3.33	29.9 16.5 3.46	26.4 21.8 3.42	24.0 24.0 3.39

See Legend and Notes on page 15.

# Performance data (cont)

## NET COOLING CAPACITIES (cont)

50SX036

Temp (F) Air Ent Condenser (Edb)		Evaporator Air—Cfm/BF								
		1050/0.04			1225/0.04			1350/0.05		
		Evaporator Air — Ewb (F)								
72	67	62	72	67	62	72	67	62	72	67
85	TC SHC kW	41.6 20.9 3.25	37.9 26.7 3.17	34.6 32.1 3.09	42.1 21.8 3.31	38.5 28.4 3.24	35.2 34.3 3.17	42.7 22.8 3.39	39.1 30.1 3.31	35.9 35.9 3.24
95	TC SHC kW	39.7 20.2 3.52	36.2 26.0 3.43	32.6 31.3 3.36	40.5 21.3 3.60	36.8 27.7 3.50	33.7 33.5 3.44	40.8 22.2 3.66	37.3 29.5 3.58	34.7 34.6 3.52
105	TC SHC kW	37.9 19.7 3.81	34.4 25.3 3.73	30.1 30.0 3.63	38.4 20.6 3.88	35.0 27.1 3.80	31.7 31.7 3.72	38.9 21.6 3.97	35.3 28.8 3.87	33.0 33.0 3.82
115	TC SHC kW	35.8 18.9 4.12	31.5 24.2 4.02	28.4 28.4 3.92	36.4 19.9 4.19	31.8 25.9 4.10	29.1 29.1 4.03	36.6 20.9 4.26	32.5 27.8 4.18	30.3 30.3 4.12

50SX042

Temp (F) Air Ent Condenser (Edb)		Evaporator Air—Cfm/BF								
		1225/0.07			1400/0.08			1575/0.09		
		Evaporator Air — Ewb (F)								
72	67	62	72	67	62	72	67	62	72	67
85	TC SHC kW	49.0 24.0 3.67	43.0 30.1 3.60	37.0 35.2 3.52	49.8 25.1 3.75	44.2 32.3 3.69	38.2 37.8 3.61	50.3 26.2 3.82	44.8 34.2 3.77	39.8 39.8 3.71
95	TC SHC kW	47.0 23.3 4.02	40.8 29.3 3.95	35.0 34.2 3.86	47.7 24.4 4.10	41.5 31.2 4.03	36.0 36.0 3.95	48.2 25.5 4.18	42.3 33.2 4.11	38.1 38.1 4.05
105	TC SHC kW	44.8 22.5 4.41	38.7 28.4 4.32	33.4 33.3 4.24	45.5 23.7 4.49	38.8 30.2 4.40	34.2 34.2 4.33	45.9 24.8 4.57	39.6 32.2 4.49	35.9 35.9 4.43
115	TC SHC kW	42.0 21.6 4.83	36.8 27.7 4.73	32.8 32.8 4.65	42.7 22.8 4.92	36.2 29.2 4.82	32.3 32.3 4.75	43.3 24.0 5.00	36.6 31.0 4.90	33.2 33.2 4.84

50SX048-311

Temp (F) Air Ent Condenser (Edb)		Evaporator Air—Cfm/BF								
		1400/0.03			1585/0.04			1800/0.05		
		Evaporator Air — Ewb (F)								
72	67	62	72	67	62	72	67	62	72	67
85	TC SHC kW	54.4 26.3 4.46	49.2 33.8 4.38	44.4 40.9 4.33	55.0 27.5 4.57	50.0 36.0 4.50	45.1 43.9 4.44	55.6 28.6 4.68	50.3 38.0 4.60	45.8 45.8 4.54
95	TC SHC kW	51.9 25.5 4.91	46.9 33.1 4.84	42.1 40.0 4.77	52.6 26.8 5.03	47.5 35.2 4.95	42.9 42.8 4.89	52.9 27.7 5.13	47.8 37.2 5.05	44.0 44.0 5.00
105	TC SHC kW	49.5 24.8 5.41	44.3 32.2 5.33	38.5 38.3 5.24	50.1 26.0 5.53	44.9 34.4 5.44	40.7 40.7 5.38	50.4 27.1 5.63	45.2 36.4 5.55	41.9 41.9 5.49
115	TC SHC kW	46.5 23.8 5.92	41.2 31.0 5.84	35.9 35.9 5.74	47.1 25.1 6.05	41.7 33.3 5.96	37.0 37.0 5.88	47.4 26.3 6.16	42.0 35.4 6.06	39.0 39.0 6.02

See Legend and Notes on page 15.

# Performance data (cont)

## NET COOLING CAPACITIES (cont)

50SX048-321

Temp (F) Air Ent Condenser (Edb)		Evaporator Air—Cfm/BF								
		1400/0.03			1550/0.04			1800/0.05		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC SHC kW	52.2 24.8 3.9	47.9 31.4 3.8	43.9 37.4 3.7	52.5 25.6 3.9	48.4 32.8 3.9	44.5 39.2 3.7	52.8 26.7 4.1	48.8 34.9 4.0	45.7 41.1 3.9
95	TC SHC kW	49.6 23.9 4.3	45.6 30.5 4.2	41.8 36.4 4.0	49.9 24.7 4.3	45.5 31.9 4.2	42.4 38.1 4.1	50.1 25.8 4.5	46.3 34.0 4.4	43.8 39.3 4.3
105	TC SHC kW	46.9 23.1 4.7	43.0 29.6 4.5	39.4 35.4 4.4	47.1 23.8 4.7	43.4 31.0 4.6	40.4 36.3 4.5	47.2 24.8 4.9	43.7 33.1 4.8	41.6 37.4 4.7
115	TC SHC kW	43.8 22.1 5.1	40.2 28.6 5.0	37.2 33.4 4.8	44.0 22.8 5.1	40.5 29.9 5.0	38.1 34.2 4.9	44.2 23.7 5.3	40.7 32.0 5.2	39.4 34.8 5.1

50SX060

Temp (F) Air Ent Condenser (Edb)		Evaporator Air—Cfm/BF								
		1750/0.03			2000/0.04			2250/0.05		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC SHC kW	69.4 34.8 5.95	61.9 44.0 5.77	54.9 52.4 5.60	70.6 36.5 6.07	63.2 47.1 5.89	56.4 56.2 5.74	71.4 37.9 6.18	64.1 50.0 6.01	58.6 58.5 5.88
95	TC SHC kW	66.3 33.7 6.44	58.7 42.7 6.25	52.1 51.2 6.87	67.4 35.5 6.58	60.0 46.0 6.38	54.0 54.0 6.23	68.4 37.2 6.70	60.9 48.9 6.50	56.1 56.1 6.38
105	TC SHC kW	63.1 32.6 6.99	55.6 41.7 6.78	49.4 49.3 6.61	64.2 34.5 7.11	56.7 44.8 6.91	51.5 51.5 6.77	65.1 36.1 7.23	57.4 47.7 7.02	53.6 53.5 6.92
115	TC SHC kW	59.5 31.5 7.56	52.3 40.4 7.34	46.7 46.7 7.19	60.6 33.3 7.69	53.2 43.5 7.47	48.6 48.5 7.36	61.4 35.1 7.82	53.9 46.4 7.59	50.5 50.5 7.51

### LEGEND

**BF**—Bypass Factor

**Ewb**—Entering Wet-Bulb

**kW**—Total Unit Power Input

**SHC**—Sensible Heat Capacity (1000 Btuh)

**TC**—Total Cooling Capacity (1000 Btuh) (net)

### NOTES:

- Ratings are net; they account for the effects of the indoor-fan motor power and heat.
- Direct interpolation is permissible. Do not extrapolate.
- The following formulas may be used:

$$t_{edb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

$t_{lwb}$  = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil ( $h_{lwb}$ )

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where:  $h_{ewb}$  = Enthalpy of air entering indoor coil

- The SHC is based on 80°F edb temperature of air entering indoor coil. Below 80°F edb, subtract (corr factor x cfm) from SHC. Above 80°F edb, add (corr factor x cfm) to SHC. Correction Factor = 1.10 x (1 - BF) x (edb - 80).

# Performance data (cont)

## FILTER PRESSURE DROP (in. wg)

UNIT SIZE	FILTER SIZE (in.)	CFM																
		700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
024-036	24 x 24	.06	.06	.07	.07	.08	.09	.10	.10	.11	—	—	—	—	—	—	—	—
042-060	24 x 30	—	—	—	—	—	—	.08	.09	.09	.10	.11	.12	.13	.14	.15	.17	.18

## WET COIL PRESSURE DROP

UNIT SIZE	AIRFLOW (cfm)	PRESSURE DROP (in. wg)
024	600	0.039
	700	0.058
	800	0.075
	900	0.088
030	700	0.075
	800	0.081
	900	0.088
	1000	0.095
	1200	0.123
036	1000	0.068
	1200	0.088
	1400	0.108
	1600	0.123
042	1000	0.048
	1200	0.069
	1400	0.088
	1600	0.102
048	1400	0.068
	1600	0.075
	1800	0.088
060	1700	0.082
	1900	0.095
	2100	0.108
	2300	0.123

## ACCESSORY ELECTRIC HEATER PRESSURE DROP (in. wg)

HEATER kW	CFM								
	600	800	1000	1200	1400	1600	1800	2000	2200
5-20	0.030	0.033	0.037	0.042	0.047	0.052	0.060	0.067	0.075

## MINIMUM AIRFLOW FOR SAFE ELECTRIC HEATER OPERATION (Cfm)

SIZE					
024	030	036	042	048	060
700	875	1200	1225	1400	1750

# Performance data (cont)

## DRY COIL AIR DELIVERY\* — HORIZONTAL AND DOWNTIME DISCHARGE (DEDUCT 10% FOR 208 V)

UNIT 50SX	MOTOR SPEED	AIR DELIVERY	230 VOLT HORIZONTAL DISCHARGE										
			External Static Pressure (in.wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
024, 030	Low	Watts	280	275	265	255	250	245	240	—	—	—	—
		Cfm	820	810	755	700	660	600	560	—	—	—	—
	Med	Watts	365	360	350	345	340	330	320	310	300	—	—
		Cfm	1025	1010	975	940	900	850	800	720	630	—	—
036	High	Watts	—	—	490	480	470	460	445	430	410	390	380
		Cfm	—	—	1300	1255	1200	1150	1080	1005	915	790	620
	Low	Watts	520	495	474	458	445	425	—	—	—	—	—
		Cfm	1375	1335	1290	1240	1200	1140	—	—	—	—	—
042	Med	Watts	575	560	535	510	480	460	440	425	—	—	—
		Cfm	1520	1490	1450	1400	1380	1300	1200	1080	—	—	—
	High	Watts	—	—	—	—	650	614	575	540	510	480	—
		Cfm	—	—	—	—	1560	1500	1380	1280	1170	1060	—

\* Air delivery values are based on operating voltage of 230 v dry coil, without filter or electric heater. Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.

### NOTES:

1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator-coil frosting may occur at airflows below this point.
2. Dashes indicate portions of the table that are beyond the blower motor capacity or are not recommended.

## DRY-COIL AIR DELIVERY\* — FAN ONLY AND COOLING; HORIZONTAL AND DOWNTIME DISCHARGE FOR INTEGRATED CONTROL MOTOR UNITS AT 230 V

UNIT 50SX	FAN ONLY (Cfm)	COOLING (Cfm)
048	1400	1600
060	1750	2000

\* Air delivery values are for dry coil at 230 v. Airflow is independent of external static pressure within  $\pm 5\%$  of table values up to 0.8 in. wg.

NOTE: Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator-coil icing may occur at airflows below this point. Water blow-off may occur at airflows above 450 cfm per 12,000 Btuh of rated cooling capacity.

## DRY-COIL AIR DELIVERY\* — HEATING; HORIZONTAL AND DOWNTIME DISCHARGE FOR INTEGRATED CONTROL MOTOR UNITS AT 230 V

TERMINAL	1	2	3	4
Available Airflow (Cfm)	1365	1470	1680	1840

\* Available delivery values are for dry coil at 230 v. Airflow is independent of external static pressure within  $\pm 5\%$  of table values up to 0.8 in. wg.

### NOTES:

1. Dashed areas do not fall within approved range.
2. The above values occur with the AC/HP CFM ADJUST select jumper on Easy Select Interface board set on MED.
3. Airflow can be adjusted +10% or -10% by selecting HI or LO for all modes except FAN ONLY.

# Electrical data

UNIT SIZE 50SX	V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OUTDOOR FAN MOTOR	INDOOR FAN MOTOR			
		Min	Max	RLA	LRA	FLA	FLA	UNIT ONLY MCA	UNIT ONLY MAX FUSE OR CKT BKR	UNIT ONLY MOCP
024-311	208/230-1	187	253	11.4	56.0	1.4	2.0	17.7	25	—
024-321	208/230-1	187	253	12.1	54.0	1.4	2.0	18.5	25	—
030	208/230-1	187	253	15.0	72.5	1.4	2.6	22.8	30	—
036	208/230-1	187	253	16.7	95.0	1.4	2.8	25.1	30	—
042	208/230-1	187	253	20.0	104.0	1.4	3.1	29.5	35	—
048-311	208/230-1	187	253	26.4	129.0	1.4	7.2	41.6	50	—
048-321	208/230-1	187	253	20.8	109.0	1.4	7.2	34.6	40	—
060	208/230-1	187	253	32.1	169.0	2.1	7.2	49.4	60	—

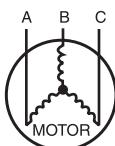
(See Legend following Electrical Data chart)

## LEGEND

FLA	— Full Load Amps
LRA	— Locked Rotor Amps
MCA	— Minimum Circuit Amps
MOCP	— Maximum Overcurrent Protection
RLA	— Rated Load Amps
CKT BKR	— Circuit Breaker



EXAMPLE: Supply voltage is 460-3-60.



$$AB = 452 \text{ v}$$

$$BC = 464 \text{ v}$$

$$AC = 455 \text{ v}$$

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.

$$(AB) 457 - 452 = 5 \text{ v}$$

$$(BC) 464 - 457 = 7 \text{ v}$$

$$(AC) 457 - 455 = 2 \text{ v}$$

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

## NOTES:

- In compliance with NEC (National Electrical Code) requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be Power Supply fuse. Canadian units may be fuse or circuit breaker.
- Minimum wire size is based on 60 C copper wire. If other than 60 C wire is used, or if length exceeds wire length in table, determine size from NEC.
- Unbalanced 3-Phase Supply Voltage  
*Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.*

% Voltage imbalance

$$= 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

**ACCESSORY ELECTRIC HEATER PACKAGES — 208/240 V, SINGLE PHASE —  
DUAL-POINT WIRING CONNECTIONS**

UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT	ELECTRIC HEAT (kW)*		HEATER FLA		MINIMUM CIRCUIT AMPACITY FOR WIRE SIZING		MAXIMUM FUSE OR C K T BRKR		MOCP	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
024	CPHEATER001A00	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	CPHEATER002A00	5.60	7.5	26.9	31.3	33.7	39.1	35	40	—	—
	CPHEATER003A00	7.50	10.0	36.1	40.6	45.1	50.8	50	60	—	—
030	CPHEATER001A00	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	CPHEATER002A00	5.60	7.5	26.9	31.3	33.7	39.1	35	40	—	—
	CPHEATER003A00	7.50	10.0	36.1	40.6	45.1	50.8	50	60	—	—
	CPHEATER004A00	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
036	CPHEATER001A00	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	CPHEATER002A00	5.60	7.5	26.9	31.3	33.7	39.1	35	40	—	—
	CPHEATER003A00	7.50	10.0	36.1	40.6	45.1	50.8	50	60	—	—
	CPHEATER004A00	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
	CPHEATER005A00	13.10	17.5	65.6	75.0	82.0	93.8	—	—	90	100
042	CPHEATER001A00	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	CPHEATER002A00	5.60	7.5	26.9	31.3	33.7	39.9	35	40	—	—
	CPHEATER003A00	7.50	10.0	36.1	40.6	45.1	50.8	50	60	—	—
	CPHEATER004A00	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
	CPHEATER006A00	15.00	20.0	72.1	83.3	90.1	104.2	—	—	100	110
048	CPHEATER001A00	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	CPHEATER002A00	5.60	7.5	26.9	31.3	33.7	39.1	35	40	—	—
	CPHEATER003A00	7.50	10.0	36.1	40.6	45.1	50.8	50	60	—	—
	CPHEATER004A00	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
	CPHEATER006A00	15.00	20.0	72.1	83.3	90.1	104.2	—	—	100	110
060	CPHEATER001A00	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	CPHEATER002A00	5.60	7.5	26.9	31.3	33.7	39.1	35	40	—	—
	CPHEATER003A00	7.50	10.0	36.1	40.6	45.1	50.8	50	60	—	—
	CPHEATER004A00	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
	CPHEATER006A00	15.00	20.0	72.1	83.3	90.1	104.2	—	—	100	110

**LEGEND**

- UL — Underwriters' Laboratories
- CSA — Canadian Standards Association
- NEC — National Electrical Code
- FLA — Full Load Amps
- CKT BRKR — Circuit Breaker
- MOCP — Maximum Overcurrent Protection

\*Electric heat capacity (kW) is based on heater voltages of 208 v or 240 v. If power distribution voltage to units varies from rated heated voltage, see Wattage Multiplication Factors table below.

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the over-current protective device for the unit shall be fuse or HACR breaker.



**WATTAGE MULTIPLICATION FACTORS**

HEATER VOLTAGE RATING	ACTUAL HEATER VOLTAGE	MULTIPLICATION FACTOR
240	200	0.69
	208	0.75
	220	0.84
	230	0.92
	240	1.00

EXAMPLE: 20.0 kW (at 240 v) heater on 230 v

= 20.0 (0.92 multiplication factor)  
= 18.4 kW capacity at 230 v.

**ACCESSORY ELECTRIC HEATER PACKAGES — 208/240 V, SINGLE PHASE —  
SINGLE-POINT WIRING CONNECTIONS**

UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT	ELECTRIC HEAT VOLTS/kW*		HEATER FLA		MINIMUM CIRCUIT AMPACITY FOR WIRE SIZING		MAXIMUM FUSE OR C K T BRKR		MOCP	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
024	CPHEATER001A00	3.75	5.0	18.0	20.8	25.0	28.5	25	30	—	—
	CPHEATER002A00	5.6	7.5	26.9	31.3	36.1	41.6	40	45	—	—
	CPHEATER003A00	7.5	10.0	36.1	40.6	47.6	53.3	50	60	—	—
030	CPHEATER001A00	3.75	5.0	18.0	20.8	25.8	29.3	30	30	—	—
	CPHEATER002A00	5.6	7.5	26.9	31.3	36.9	42.3	40	45	—	—
	CPHEATER003A00	7.5	10.0	36.1	40.6	48.4	54.0	50	60	—	—
	CPHEATER004A00	11.3	15.0	54.3	62.5	71.1	81.4	—	—	80	90
036	CPHEATER001A00	3.75	5.0	18.0	20.8	26.0	29.5	30	30	—	—
	CPHEATER002A00	5.6	7.5	26.9	31.3	37.1	42.6	40	45	—	—
	CPHEATER003A00	7.5	10.0	36.1	40.6	48.6	54.3	50	60	—	—
	CPHEATER004A00	11.3	15.0	54.3	62.5	71.4	81.6	—	—	80	90
	CPHEATER005A00	13.1	17.5	65.6	75.0	85.5	97.3	—	—	90	100
042	CPHEATER001A00	3.75	5.0	18.0	20.8	29.4	29.9	35	35	—	—
	CPHEATER002A00	5.6	7.5	26.9	31.3	37.5	42.9	35	45	—	—
	CPHEATER003A00	7.5	10.0	36.1	40.6	49.0	54.6	50	60	—	—
	CPHEATER004A00	11.3	15.0	54.3	62.5	71.8	82.0	—	—	80	90
	CPHEATER006A00	15.0	20.0	72.1	83.3	94.0	108.0	—	—	100	110
048	CPHEATER001A00	3.75	5.0	18.0	20.8	34.6	35.0	40	40	—	—
	CPHEATER002A00	5.6	7.5	26.9	31.3	42.6	48.1	40	50	—	—
	CPHEATER003A00	7.5	10.0	36.1	40.6	54.1	59.8	60	60	—	—
	CPHEATER004A00	11.3	15.0	54.3	62.5	76.9	87.1	—	—	80	90
	CPHEATER006A00	15.0	20.0	72.1	83.3	99.1	113.2	—	—	100	125
060	CPHEATER001A00	3.75	5.0	18.0	20.8	49.4	49.4	60	60	—	—
	CPHEATER002A00	5.6	7.5	26.9	31.3	49.4	49.4	60	60	—	—
	CPHEATER003A00	7.5	10.0	36.1	40.6	54.1	59.8	60	60	—	—
	CPHEATER004A00	11.3	15.0	54.3	62.5	76.9	87.1	—	—	80	90
	CPHEATER006A00	15.0	20.0	72.1	83.3	99.1	113.2	—	—	100	125

**LEGEND**

- UL** — Underwriters' Laboratories
- CSA** — Canadian Standards Association
- NEC** — National Electrical Code
- FLA** — Full Load Amps
- CKT BRKR** — Circuit Breaker
- MOCP** — Maximum Overcurrent Protection (fuses or circuit breaker)

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker.



\*Electric heat capacity (kW) is based on heater voltages of 208 v or 240 v. If power distribution voltage to units varies from rated heated voltage, see Wattage Multiplication Factors table on page 18.

# Controls

## Operating sequence

**Cooling** — When power is supplied to unit, transformer (TRAN) is energized.

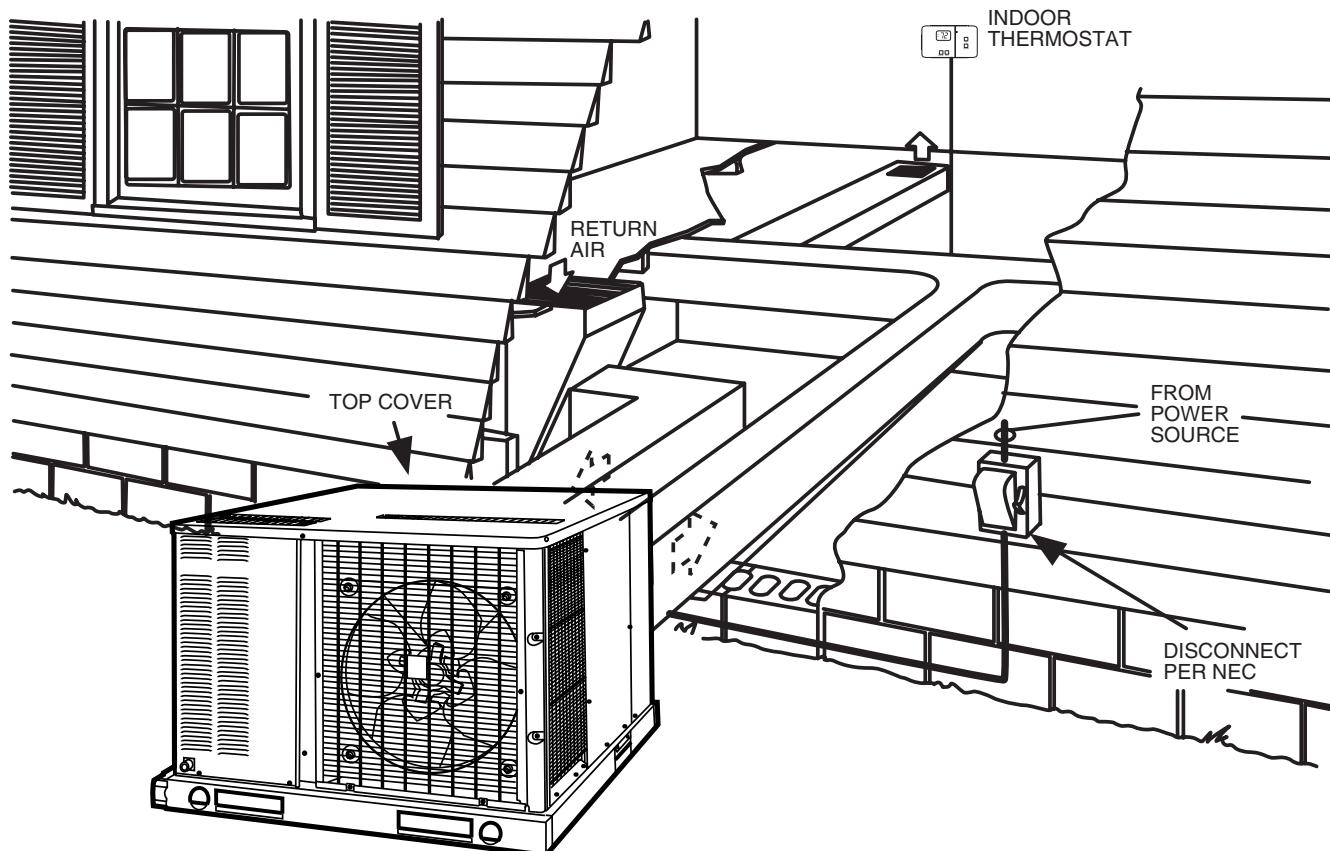
With room thermostat set to call for cooling and evaporator fan set in AUTO. Position, sequence of operation is as follows:

On a call for cooling, thermostat makes circuits R-Y and R-G. When room temperature rises, thermostat makes a circuit to R-Y to contactor (C), starting outdoor (condenser) fan motor (OFM) and compressor (COMP). Circuit R-G is also made, which energizes indoor (evaporator) fan relay/time delay relay (IFR/TDR), starting the indoor (evaporator) fan motor (IFM). The IFM stops 30 seconds after the thermostat is satisfied.

When thermostat is satisfied, contacts open, deenergizing C, and the IFR/TDR, then the COMP, IFM, and OFM stop.

**Heating** — If accessory electric heaters are installed, on a call for heat, circuit R-W is made through the thermostat contacts. Circuit R-G is made which energizes the IFR/TDR. If the heaters are staged, then the thermostat closes a second set of contacts (W2) when second stage is required. When thermostat is satisfied, contacts open, deenergizing the heater relay and the IFR/TDR. The IFM stops 30 seconds after the thermostat is satisfied.

## Typical installation



# Application data

**Condensate trap** — A 2-in. condensate trap must be field supplied.

**Ductwork** — Secure vertical discharge ductwork to roof curb. For horizontal discharge applications, attach ductwork to unit with flanges.

**To convert a unit to vertical discharge**, an accessory duct cover kit must be used to cover all horizontal discharge duct openings. All vertical discharge duct covers must be removed. Units are shipped in the horizontal discharge configuration.

**Airflow** — Units are draw-thru on cooling and heating.

**Maximum cooling airflow** — To minimize the possibility of condensate blow-off from the evaporator, airflow through units should not exceed 450 cfm/ton.

**Minimum cooling airflow** is 350 cfm/ton.

**Minimum ambient operating temperature** for all standard units is 40°F. With accessory low ambient temperature kit, units can operate at temperatures down to 0°F.

## LEGEND AND NOTES FOR TYPICAL WIRING SCHEMATIC (024-042)

<b>CSA</b>	— Contactor, Compressor
<b>CAP</b>	— Capacitor
<b>COMP</b>	— Compressor Motor
<b>CTD</b>	— Compressor Time Delay
<b>DT</b>	— Discharge Thermostat
<b>EQUIP</b>	— Equipment
<b>FL</b>	— Fuse Link
<b>FU</b>	— Fuse
<b>GND</b>	— Ground
<b>HR</b>	— Heater Relay (Strip Heat)
<b>IFM</b>	— Indoor-Fan Motor
<b>IFR</b>	— Indoor-Fan Relay
<b>LS</b>	— Limit Switch
<b>OFM</b>	— Outdoor-Fan Motor
<b>QT</b>	— Quadruple Terminal
<b>ST</b>	— Start Thermister
<b>TB</b>	— Terminal Block
<b>TDR</b>	— Time Delay Relay
<b>TH</b>	— Thermostat-Heating
<b>TRAN</b>	— Transformer

	Field Splice
	Marked Wire
	Terminal (Marked)
	Terminal (Unmarked)
	Terminal Block
	Splice
	Splice (Marked)
	Factory Wiring
	Field Control Wiring
	Field Power Wiring
	Accessory or Optional Wiring
	To indicate common potential only, not to represent wiring

**NOTES:**

1. If any of the original wire furnished must be replaced, it must be replaced with type 90°C wire or its equivalent.
2. Use copper conductors only.

## LEGEND AND NOTES FOR TYPICAL WIRING SCHEMATIC (048, 060)

<b>CSA</b>	— Contactor, Compressor
<b>CAP</b>	— Capacitor
<b>COMP</b>	— Compressor Motor
<b>CTD</b>	— Compressor Time Delay
<b>EQUIP</b>	— Equipment
<b>FL</b>	— Fuse Link
<b>FU</b>	— Fuse
<b>GND</b>	— Ground
<b>HR</b>	— Heater Relay (Strip Heat)
<b>ICM</b>	— Integral Electronic Motor
<b>LS</b>	— Limit Switch
<b>OFM</b>	— Outdoor-Fan Motor
<b>QT</b>	— Quadruple Terminal
<b>TB</b>	— Terminal Block
<b>TRAN</b>	— Transformer

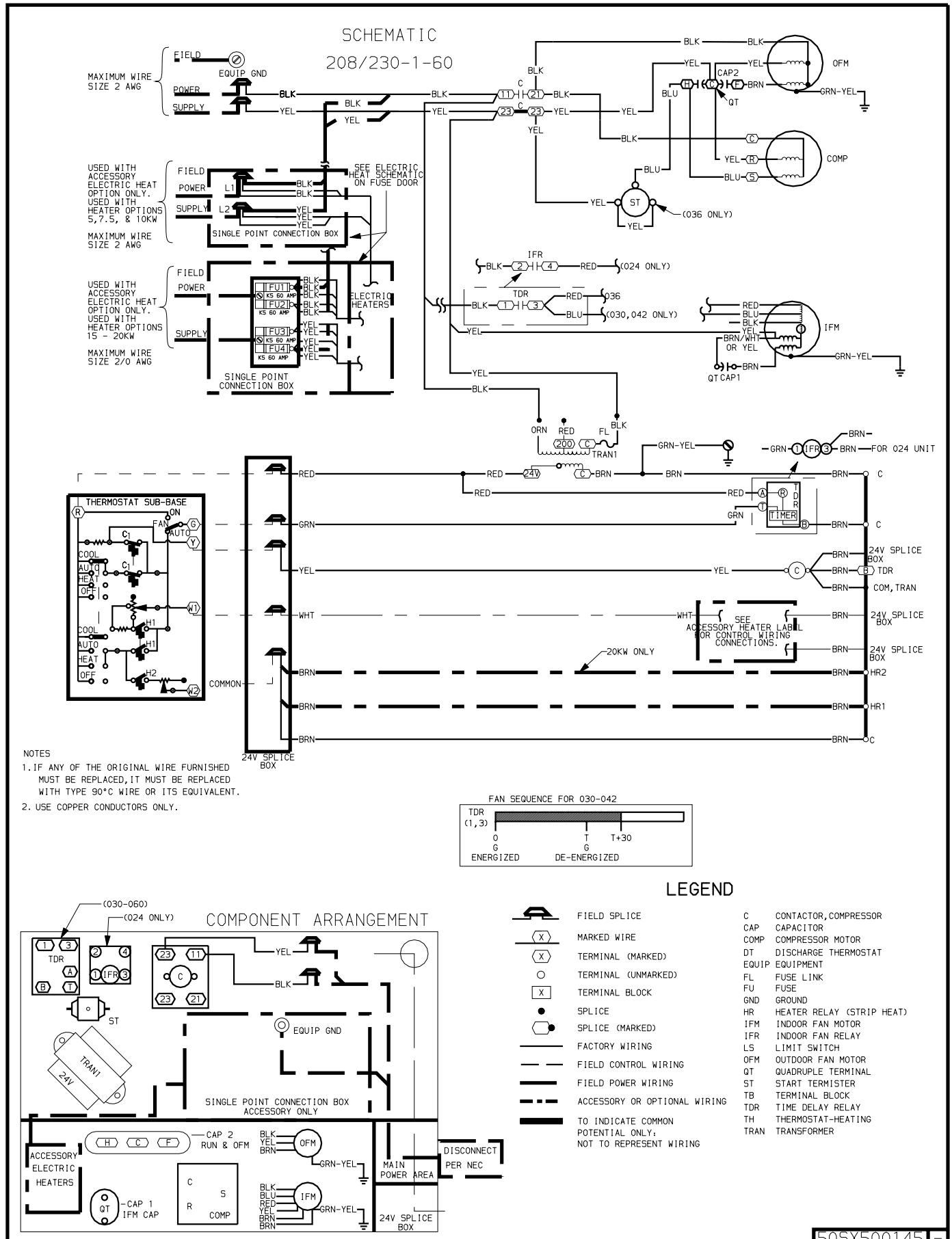
	Field Splice
	Marked Wire
	Terminal (Marked)
	Terminal (Unmarked)
	Terminal Block
	Splice
	Splice (Marked)
	Factory Wiring
	Field Control Wiring
	Field Power Wiring
	Accessory or Optional Wiring
	To indicate common potential only, not to represent wiring

**NOTES:**

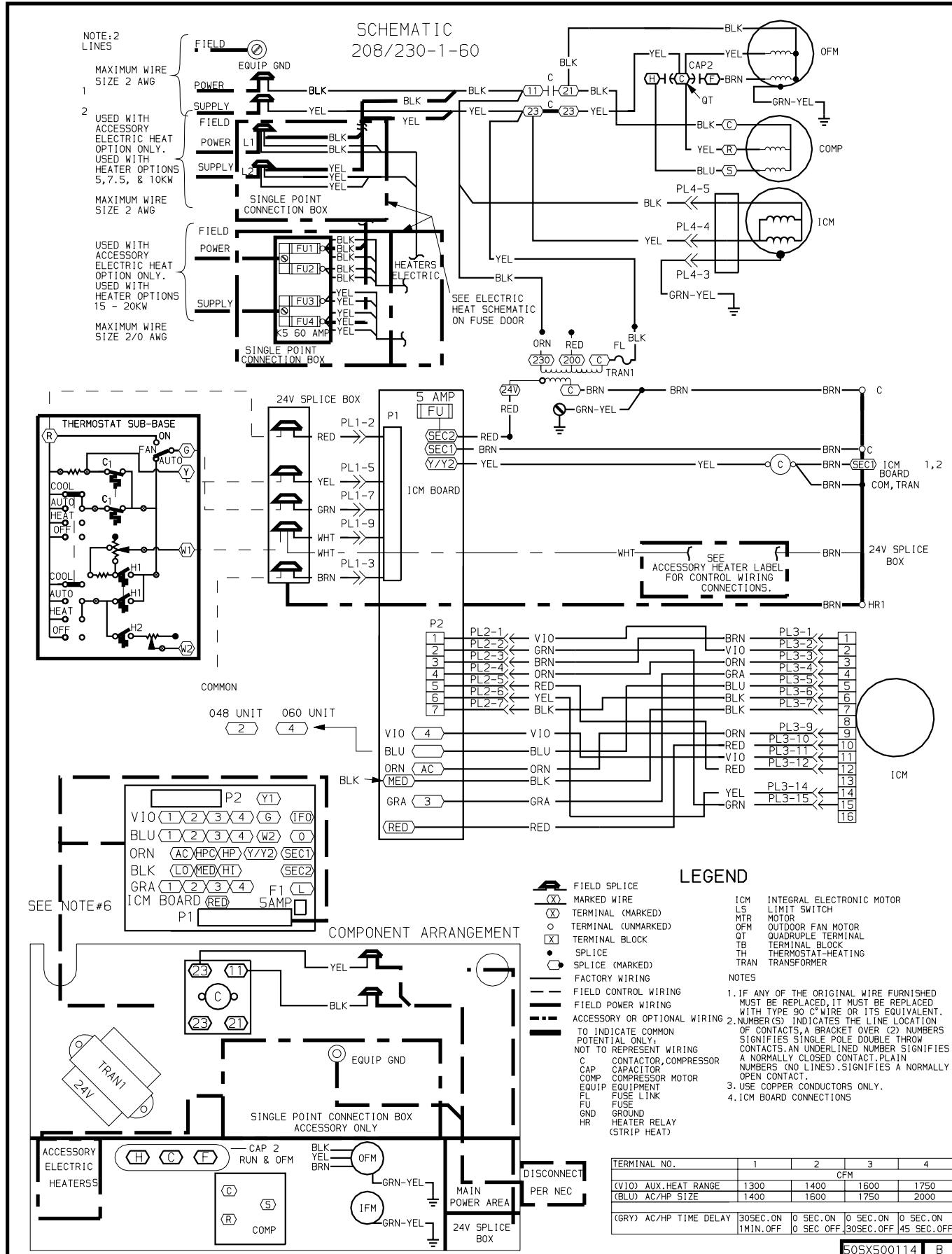
1. If any of the original wire furnished must be replaced, it must be replaced with type 90°C wire or its equivalent.
2. Number(s) indicates the line location of contacts. A bracket over 2 numbers signifies single pole double throw contacts. An underlined number signifies a normally closed contact. Plain numbers (on lines) signifies a normally open contact.
3. Use copper conductors only.

TERMINAL NO.	1	2	3	4
	Cfm			
(VIO) Aux. Heat Range	1300	1400	1600	1750
(BLU) AC/HP Size	1400	1600	1750	2000
(GRY) AC/HR Time Delay	30 sec on 1 min. off	0 sec on 0 sec off	0 sec on 30 sec off	0 sec on 45 sec off

# Typical wiring schematic — sizes 024-042



## Typical wiring schematic (cont) — sizes 048, 060







# Guide specifications

## Packaged Rooftop Heat Pump with Electric Heat — Constant Volume Application

### HVAC Guide Specifications

Size Range: 2 to 5 Tons, Nominal Cooling

Carrier Model Number: 50SX

#### Part 1—General

##### 1.01 SYSTEM DESCRIPTION

Outdoor rooftop/slab mounted, electrically controlled Heat Pump utilizing a scroll compressor for cooling duty and optional electric heaters for heating duty. Unit shall discharge supply air vertically or horizontally as shown on contract drawings.

Condenser fan/coil section shall have a blow-thru design for minimum sound levels.

##### 1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with ARI Standards 210/240-89 and 270-89. Designed in accordance with UL Standard 564.
- B. Unit shall be UL listed and CSA certified as a total package for safety requirements.
- C. Unit shall be manufactured in a factory registered to ISO 9002 (International Standards Organization) manufacturing quality standard.
- D. Roof curb shall be designed to conform to NRCA Standards.
- E. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

##### 1.03 DELIVERY, STORAGE AND HANDLING

Unit shall be stored and handled per manufacturer's recommendations.

#### Part 2 — Products

##### 2.01 EQUIPMENT

###### A. General:

Factory-assembled, single-piece, Heat Pump. Contained within the enclosure shall be all factory wiring, piping, controls, refrigerant charge (R-22), and special features required prior to field start-up.

###### B. Unit Cabinet:

- 1. Unit cabinet shall be constructed of phosphated, zinc-coated, pre-painted steel capable of withstanding 500 hours in salt spray.
- 2. Evaporator fan compartment interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, flexible fiberglass insulation, coated on the air side with aluminum foil.
- 3. Cabinet panels shall be easily removable for servicing.
- 4. Unit shall have a field-supplied condensate trap.
- 5. Unit insulation shall conform to ASHRAE Standard 62P.

###### C. Fans:

- 1. Evaporator fan:
  - a. Fan shall be 2- or 3-speed (sizes 024-048) or vari-

able speed (sizes 048, 060) direct drive as shown on the equipment drawings.

- b. Fan wheel shall be made from steel, be double inlet type. It shall have forward curved blades with a corrosion resistant finish and be dynamically balanced.

- 2. Condenser fan shall be of the direct-drive propeller type with aluminum blades riveted to corrosion resistant steel spiders. It shall be dynamically balanced, and discharge air vertically upwards or horizontally.

###### D. Compressor:

Fully hermetic, scroll type with internal and external vibration isolation.

###### E. Coils:

- 1. Evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.
- 2. Tube sheet openings shall be belled to prevent tube wear.

###### F. Refrigerant Components:

Refrigerant metering device shall be of the Acutrol™ feed system type.

###### G. Filter Section:

Filter section shall consist of field-installed, throw-away, 1-in. thick fiberglass filters of commercially available sizes.

###### H. Controls and Safeties:

- 1. Unit controls:  
Unit shall be complete with self-contained low-voltage control circuit.

###### I. Safeties:

Compressor shall incorporate a solid-state compressor protector which provides reset capability at the space thermostat.

###### J. Operating Characteristics:

- 1. Unit shall be capable of starting and running at 115°F ambient outdoor temperature per maximum load criteria of ARI Standard 210.
- 2. Compressor with standard controls shall be capable of operation down to 40° F ambient outdoor temperature.

###### K. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location.

###### L. Motors:

- 1. Compressor motors shall be of the refrigerant cooled type with line break thermal and current overload protection.
- 2. All fan motors shall have permanently lubricated bearings, and inherent automatic reset thermal overload protection.
- 3. Condenser fan motor shall be totally enclosed.

# Guide specifications (cont)

- L. Special Features Available:
  - 1. Roof Curb:
    - a. Formed 16-gage galvanized steel with wood nailer strip and capable of supporting entire unit weight.
    - b. Allows for installing and securing ductwork to curb prior to mounting unit on the curb.
  - 2. Manual Damper:  
Manual damper package shall consist of damper, birdscreen, and rainhood which can be preset to admit outdoor air for year-round ventilation.
  - 3. Low Ambient Kit:  
Package shall consist of a solid-state control and condenser coil temperature sensor for controlling condenser-fan motor operation. Accessory shall allow unit to operate down to 0° F outdoor ambient temperature.
  - 4. Heating Section:
    - a. Equipped with field-installed electric resistance heaters(s) of the characteristics shown in the equipment schedule.
    - b. Heater elements shall be open wire type, adequately supported and insulated with ceramic bushings.
    - c. Electric heater packages must provide single-point power connection capability.
  - 5. Lifting Bracket:  
Kit shall provide attachment points for rigging straps. (Not required for units with optional base rail.)
  - 6. Filter Rack:  
Filter rack shall provide filter mounting for horizontal and downflow applications.
  - 7. High- and Low-Pressure Switch Kits:  
Kit shall provide high- and low-pressure safety protection.
  - 8. Duct Cover Kit:  
Kit shall provide covers for horizontal ducts when downflow application is used.
  - 9. Rectangular Duct Connection Kit:  
Kit shall allow for easy conversion from round to rectangular ducts.
  - 10. Thermostats and Subbases:  
Thermostats and subbases shall provide for heating and cooling control.
  - 11. Electronic Programmable Thermostat:  
Thermostat provides 2-stage heating and 2-stage cooling control with communication ability.
  - 12. Base Rails:  
Base rails shall provide holes for rigging and handling. Base rail hole shall also provide structural support for horizontal applications.
  - 13. Time Guard® Device:  
Solid-state control shall protect compressor by preventing short cycling.
  - 14. Coil Options:  
Shall include factory-installed optional tin plated indoor, copper/copper and vinyl-coated refrigerant coils.



**Carrier**

A United Technologies Company